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AUTHOR Mueller, Elizabeth Jane
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ABSTRACT

This paper identifies and assesses factors that may characterize students at risk of dropping out, based on a ninth grade class of Cincinnati (Ohio) public school students which was followed for five years, from 1984-85 to 1988-89. The paper aims to develop a quick, easy, and reliable method that teachers, counselors, and principals can use to select at-risk students for intervention strategies. The following factors are assessed: (1) race; (2) sex; (3) reading achievement; (4) promotion to the next grade level; and (5) type of high school. The following factors were determined to be risk factors for the ninth grade cohort: (1) being male; (2) having a total reading National Curve Equivalent in the bottoom third of distribution on the California Achievement Test; (3) repeating the ninth grade; and (4) being enrolled in a comprehensive (non-alternative) school. Once a factor has been identified as a risk factor, the method for selecting students for intervention is based on summation of the individual student's risk factors where each factor counts one. Graduation was the termination event for 90 percent of the students who had a risk score of zero. Conversely, dropping out was the terminating event of over 80 percent of the students who had a risk score of four. Ten tables are included. (JS)

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Elizabeth Jane Mueller

Cincinnati Public Schools

Cincinnati, Ohio

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The Assessment of Risk Factors In a Student Population

Elizabeth Jane Mueller

Introduction

The at-risk population, i.e., the student population unlikely to be graduated from high school, is increasing at a rapid rate. Projections based on demographics estimate this population to soon exceed 50%. As the at-risk population increases, failure to implement effective intervention strategies may have serious implications for society. Levin (1989) describes the possible changes as follows: "As the at-risk population increases without appropriate educational interventions to improve its situation substantially, it is likely to form the underclass of a dual society. Composed of racial and ethnic minorities and persons from economically disadvantaged origins, its members will face high unemployment rates, low earnings, and menial occupations. All the while, the potential political power of the group will increase with its rise in numbers. The upper tier of society will be composed mainly of prosperous non-Hispanic whites who will be more highly educated and will enjoy high employment rates and good occupations."

Deterioration in the labor force due to poor educational preparation would be coupled with high unemployment rates and low earnings. The tax base would be eroded. Falling tax revenues would come at a time when there was an increase in the demand for public services. The two classes, an underclass composed of economically disadvantaged, poorly-educated, racial and ethnic minorities, and an upper class composed mainly of economically advantaged whites, might find themselves in a serious political conflict. There is, however, good evidence that successful intervention strategies which would dramatically reduce the at-risk population are available and are cost effective.

One step in successful intervention is identifying the at-risk student. Procedures for identifying at-risk students have been awkward or impossible for the people in the schools. The purposes of this paper are 1) to identify and assess some of the factors which put students at risk and 2) to develop a quick, easy and reliable method that teachers, counselors and principals can use to select at-risk students for intervention strategies.

The factors chosen for risk assessment in this study were selected in part on the basis of availability. Individual student data needed for the computation of the risk score is immediately available in most school systems. The factors selected for risk assessment in this study include: 1) Race, 2) Sex, 3) Reading Achievement, 4) Promotion to next grade level, 5) Type of high school. Once a factor has been identified as a risk factor, the method for selecting students for intervention is based on summation of the individual student's risk factors. The sample on which this study is conducted consists of a ninth grade class followed for five years.

The Cohort

The sample consists of the ninth grade students in the Cincinnati Public Schools during school year 1984-85. By the end of the 1988-89 school year, 2,111 students had been graduated; 1,451 students had dropped out. These two groups (3,562) form the cohort for this study. Of the cohort the school terminating event for 59% of the students was graduation, for 41% it was dropping out. The most frequently given reason for dropping out was "overage". The next most frequently given reason was "refusal to attend". Almost one third of the students dropped out, returned, and subsequently dropped out again one or more times (Table 1). Overall about 60% of the dropouts were black, evenly split between male and female (Table 2). For the remaining 40%, white males (22%) exceeded the white females (18%). On an annual basis, white males had the highest rate during the first year of the

study, black males the second year, black females the third year, black males the fourth and fifth years.

Table 1. Reason For Last Dropout By Number of Times Student Dropped Out

Reason For Last Dropout	Number Of Times Student Dropped Out 1	2	3	4	5	Raw Total
Government Service	27	9	--	--	--	36 (2.5%)
Pregnancy, Married, Unmarried Mother	94	59	10	1	--	164 (11.3%)
Expelled	23	5	1	1	--	30 (2.1%)
Overage	415	160	38	12	1	626 (43.1%)
Don't Know	133	34	12	--	--	179 (12.3%)
Working	134	46	6	--	--	186 (12.8%)
Refuse to Attend	175	50	5	--	--	230 (15.9%)
Total	1001	363	72	14	1	1451

Table 2. Race and Sex Of Dropouts By School Year

School Year	Black		White/Other		Raw Total
	Sex				
	Female	Male	Female	Male	
1984-85	46 (27%)	31 (18%)	44 (25%)	52 (30%)	173
1985-86	82 (27%)	85 (28%)	63 (21%)	70 (24%)	300
1986-87	122 (36%)	77 (23%)	69 (21%)	66 (20%)	334
1987-88	99 (30%)	115 (33%)	45 (13%)	86 (25%)	345
1988-89	91 (30%)	133 (45%)	33 (11%)	42 (14%)	299
Total	440 (30%)	441 (30%)	254 (18%)	316 (22%)	1451

The total reading NCE on the California Achievement Test was higher for the graduates than the dropouts for the four years students were tested -- there was a persistent difference of about 15 NCE's (Table 3).

Table 3. Total Reading NCE On California Achievement Tests; Graduates and Dropouts

School Year	Average NCE	
	Dropouts	Graduates
1983-84	41	56
1984-85	40	55
1985-86	41	56
1986-87	38	53

About 14% of the students were failed after entry into the cohort, most after the ninth grade. More than twice as many of the latter (65%) dropped out as were promoted (Table 4).

Table 4. Non-Promotion By Terminating Event After Entry Into The Cohort

	Terminating Event		
	Dropout	Graduation	Total
1984-85	245 (65%)	131 (34%)	376
1985-86	62 (57%)	46 (43%)	108
1986-87	16 (70%)	7 (30%)	23
1987-88	2	--	2
Total	325	184	509

Some students were enrolled in alternative schools/programs with several different focuses. Among the alternatives were schools/programs focusing on 1) creative and performing arts, 2) preparation for college, 3) international studies, 4) community studies, 5) physical education and 6) computer literacy. Other students were enrolled in more traditional, comprehensive high schools.

I. Race As A Risk Factor

Almost all of the students in the Cincinnati Public Schools are either black or white. Other races account for less than one percent of the students and are grouped with whites in this study. The school terminating event was dropping out for about 40 percent of the blacks, about 42 percent of the whites. This small difference in percent was not statistically significant. Race was not a risk factor (Table 5).

Table 5. School Terminating Event and Race

	Race		
Event	Black	White/Other	Total
Dropout	881	570	1451
Graduation	1310	801	2111
Total	2191	1371	3562

Chi-Square .60, Significance .44

II. Sex As A Risk Factor

The school terminating event for about 38 percent of the females was dropping out, of the males about 44 percent. This was statistically significant (Table 6). Sex was a risk factor.

Table 6. School Terminating Event and Sex

	Race		
Event	Female	Male	Total
Dropout	694	757	1451
Graduation	1140	971	2111
Total	1834	1728	3562

Chi-Square 12.87, Significance 0.0003

III. Reading Achievement As A Risk Factor

Total reading score on the California Achievement Test (CAT) was used as a measure of academic achievement. A National Curve Equivalent (NCE) in the bottom one-third of the distribution was evaluated as a risk factor (Table 7). Being in the bottom one-third of the distribution was a risk factor.

Table 7. School Terminating Event and Total Reading NCE

	Total Reading NCE		
Event	Bottom One-Third	Top Two-Thirds	Total
Dropout	343	689	1032
Graduation	193	1793	1986
Total	2482	536	3018*

Chi-Square 255, Significance 0.

* Where data available.

IV. Repeating Ninth Grade As A Risk Factor

The school terminating event for about 85% of those repeating the ninth grade on entry to the cohort was dropping out. This was statistically significant and therefore repeating ninth grade was a risk factor (Table 8).

Table 8. School Terminating Event and Repeating Ninth Grade on Entry to Cohort (1984-85)

Event	No	Yes	Total
Dropout	731	217	948
Graduation	1787	37	1824
Total	2815	254	2772*

Chi-Square 323, Significance 0.

* Data not available for students new to the system, students in special education and others.

V. Comprehensive High School As A Risk Factor

The school terminating event for 59 percent of the students enrolled in an alternative school/program was graduation. There was a significant difference between alternative and non-alternative schools. Being in a non-alternative school program was a risk factor (Table 9).

Table 9. School Terminating Event and Enrollment in Alternative Schools

Event	Non-Alternative School/Program	Alternative School/Program	Total
Dropout	1271	180	1451
Graduation	1004	1007	2111
Totals	2375	1187	3652

Chi-Square 480, Significance 0.0

Sum of the Risk Factors to Determine Individual Risk Score

The significant risk factors for the ninth grade cohort were four.

1) Sex, male

2) Total Reading NCE in bottom third of distribution

3) Repeating ninth grade

4) Enrolled in a comprehensive (non-alternative) school

Each risk factor counts one. Example follows.

Risk Factor	Score
Female	0
Total Reading NCE = 25	1
Repeating ninth grade	1
Comprehensive high school	1
Risk Score	3

Terminating Event and the Individual Student Risk Score

Graduation was the terminating event for 90% of the students with a risk score of 0. Conversely, dropout was the terminating event of over 80% of the students with a risk score of 4 (Table 10).

Table 10. School Terminating Event By Student Risk Score

	Risk Score					
	0	1	2	3	4	Total
Dropout	57	431	598	282	83	1451
Graduation	534	873	550	138	16	2111
Column Total	591	1304	1148	420	99	3562

Chi-Square 527, Significance 0.

If students with risk-scores of two or more (about 45%) had been selected for special programs and the special programs had been successful in all cases, the dropout rate would have been reduced from its present 41% to about 14%.

Conclusions

The four risk factors identified in this study are useful in identifying at-risk students. Data needed for the computation of the student risk score is immediately available in almost all schools. The computational procedures required to compute the at-risk score is simple summation. While the procedure is simple and useful, a search needs to be made for better factors, particularly a search among demographic factors.